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A DEVICE FOR THE AUTOMATIC SPRAYING OF APPLES IN THE LABORATORY

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The device described in this circular was constructed by the writers in 1930. It is thought to possess the following advantages:

1. Twenty apples can be sprayed at one time.

2. Both top and bottom sides of the apples are thoroughly sprayed.

3. Every apple is in the spray cone for the same length of time and, if the spray is uniform, is exposed to exactly the same amount of material.

4. The machine is fairly simple and inexpensive.

5. It has been used in spraying more than 100,000 apples since 1930 and is now as serviceable as when first built.

The machine (fig. 1) consists of a flat turntable 3 feet in diameter, having around its outer rim 20 upright spindles set in brass bearings. Each spindle consists of a $\frac{1}{4}$-inch iron rod with a tightly fitted wooden collar 1 inch thick and $2\frac{1}{2}$ inches in diameter at a distance of $1\frac{1}{2}$ inches from the lower end. A $\frac{1}{8}$-inch hole is drilled for a distance of $1\frac{1}{4}$ inches into the upper end of each spindle. The purpose of this hole is to support a 4-inch length of no. 9 galvanized iron wire. The upper, sharpened end of this wire is thrust into the calyx of an apple. As it passes between the hood and the sprayer, each apple is turned three and one-half times on its own axis by means of a stationary buffer which makes contact with the wooden collar at the base of the spindle. Resiliency is imparted to the contact surface of the buffer by means of a length of heavy-walled rubber tubing covered with several thicknesses of inner tire tubing.

A washing-machine motor with gear-reduction box is used to revolve the turntable at the rate of two revolutions per minute by means of a friction drive. Since spray solutions, especially those containing soaps or oils, are likely to cause slipping of the contacting surfaces, the outer edge of the turntable is covered with heavy canvas belting, and a metal collar, perforated so as to present a roughened surface, is placed around the impeller wheel of the motor so that slipping is prevented and smooth, uninterrupted turning is assured. The turntable rests on four casters and is held in position by four small guide wheels bearing against its inner edge.

A metal shield, shellacked to prevent corrosion, catches the spray drift and guides it into a bucket beneath the machine. Other drift in front of the machine is directed into another bucket.

Spraying is accomplished by means of an electric paint sprayer which supplies compressed air to a 2-gallon tank containing the spray solution. The nozzle is directed at the apple, first from an elevated position on an upright standard and then from below.

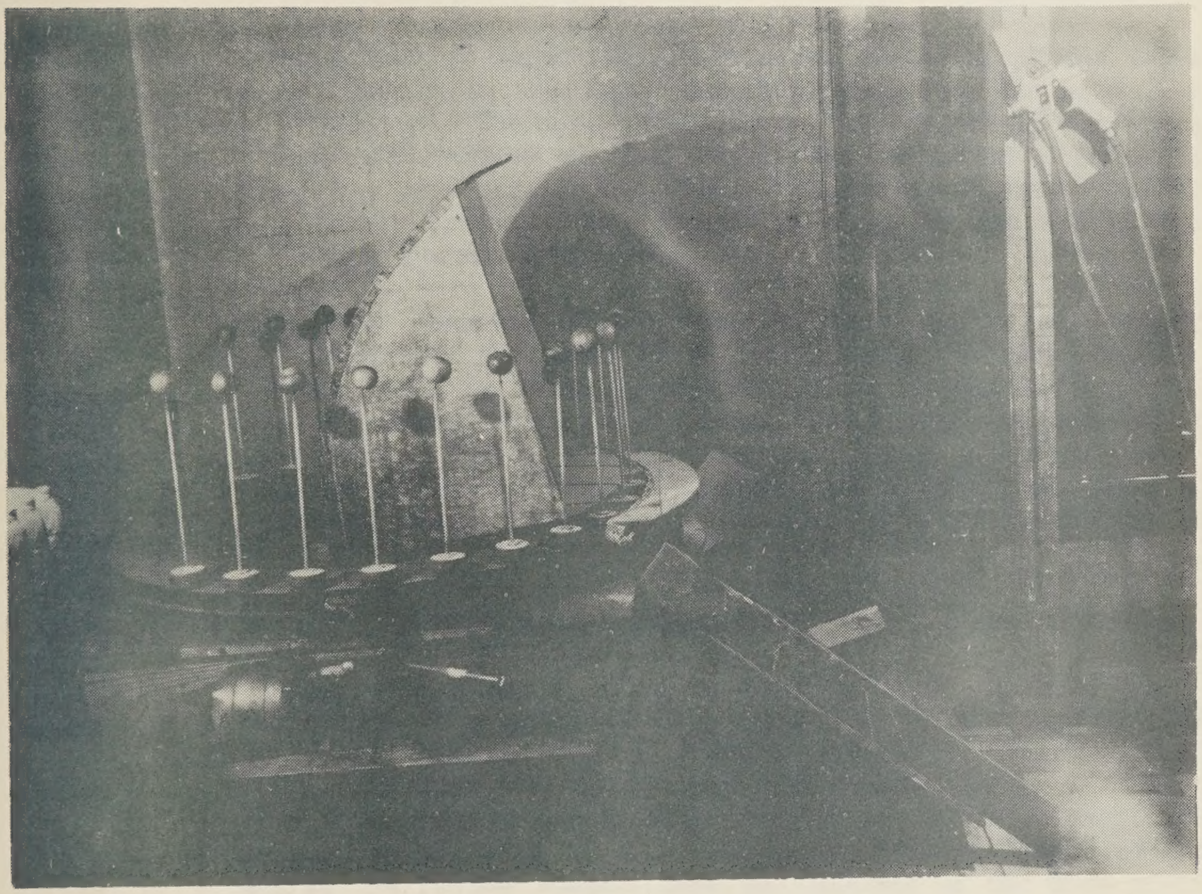

Figure 1.--A device for the automatic spraying of apples.